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EXAMINER

KAO, CHIH CHENG G

ART UNIT PAPER NUMBER

2882

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/664,338

Applicant(s)

HELL ET AL.

Examiner

Chih-Cheng Glen Kao

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3, 4, 6, 8, 10-15, 17, ~~18~~, 20 and 22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 3, 4, 6, 8, 10-15, 17 and 20 is/are rejected.

- 7) ☒ Claim(s) ~~18~~ and 22 is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 18 is improper under 37 CFR 1.121(c)(2), which states that a claim canceled by amendment (deleted in its entirety) may be reinstated only by a subsequent amendment presenting the claim as a new claim with a new claim number. Note that claim 18 was canceled in the Amendment made of record on 9/3/02, but was reinstated in the Amendment made of record on 7/11/03.

Misnumbered claim 18 has been renumbered as claim 22.

2. Claim 22 is objected to for a minor formality, which appears to be a draft error creating lack of antecedent basis problems. In line 2, "said heat exchanger" is recited. This objection may be obviated by inserting - first annular- - after "said". For purposes of examination, the claim has been treated as such. Appropriate correction is required.

3. Claim 22 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Every limitation in claim 22 has already been recited in claim 17.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 6, 8, 10-15, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (US patent 5313512) in view of Kroener (US patent 4866743) and Burke et al. (US Patent 5299249) and Deucher et al. (US patent 5610968).
5. With regards to independent claims 8, 17, and 20, Tanaka discloses a computed tomography arrangement having an x-ray source (Fig. 7, #1) which is rotatable around a rotational axis (col. 4, lines 30-32) and a detector mounted opposite each other (Fig. 7, 'D'), the improvement of a cooling arrangement for said x-ray source comprising a first heat exchanger (Fig. 6 and 7) having at least two heat exchange elements (Fig. 6, #2a and 2b), wherein said heat exchanger is rotatable around said rotational axis (col. 4, lines 32-33).

However, Tanaka does not disclose a gantry, a first annular heat exchanger, and a second annularly disposed heat exchanger in a thermally conductive annular path with the first heat exchanger and a flow path with medium for transferring heat from a first heat exchanger, said second heat exchanger being stationary relative to said first heat exchanger, a thermally

conductive annular path between the heat exchangers, nor a first heat exchanger rotatable to generate an airstream guided by a plurality of inter-engaging annular guide devices.

Kroener teaches a gantry (Fig 1, #3), a second annularly (Fig. 1, #9 and 27) exterior heat exchanger in a thermally conductive annular path with the first heat exchanger (col. 3, lines 45-47) and a flow path with medium for transferring heat from a first heat exchanger (col. 4, lines 8-11), said second heat exchanger being stationary relative to said first heat exchanger (Fig. 1, #24 and 25 connected to #2). Deucher et al. teaches a thermally conductive annular path between the heat exchangers (Fig. 4, slits above #54) with a first heat exchanger rotatable to generate an airstream guided by an annular guide device (col. 5, lines 9-24). Burke et al. further teaches an annular heat exchanger (col. 3, lines 55-65) and a plurality of inter-engaging annular guide devices (Fig. 4, #70).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the second ring-like heat exchanger components and gantry of Kroener with the device of Tanaka, since one would be motivated to have a gantry to mount the source, detector and heat exchangers onto while rotating these objects around the subject as shown by Kroener (Fig. 1). Secondly, one would be motivated to have a second heat exchanger components to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have an annular heat exchanger of Burke et al. with the device of Tanaka, since one would be motivated to incorporate the heat exchanger to transfer heat generated during the generation of x-ray to another cooling apparatus as implied from Burke et al. (col. 3, lines 55-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have a second annularly disposed heat exchanger with the suggested device of Tanaka in view of Kroener and Burke et al., which is explained with motivation as follows. Kroener teaches a second heat exchanger (Fig. 1, #27). Burke et al. teaches an annular heat exchanger (Fig. 1, C). These heat exchangers are considered art-recognized equivalents in that they both are used in cooling down x-ray systems. It would have been within routine skill in the art to substitute the annularly disposed heat exchanger of Burke et al. for the second heat exchanger of Kroener, which in combination, can be incorporated into Tanaka. One would be motivated to use an annular heat exchanger to transfer heat generated by x-rays to another cooling apparatus as implied from Burke et al. (Fig. 1, C to D) and Kroener (Fig. 1, #27 to 35).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made to have the annular path of Deucher et al. with the suggested device of Tanaka in view of Kroener and Burke et al., since one would be motivated to remove excess heat as shown by Deucher et al. (col. 5, lines 8-13) and to remove waste heat (col. 1, lines 25-26).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the rotatable heat exchanger to generate air guided by an annular device of Deucher et al. with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would be motivated to use it to remove excess heat which may cause damage as implied from Deucher et al. (col. 5, lines 10-25).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have a plurality of inter-engaging annular devices of Burke et al. with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would

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be motivated to use it to remove excess heat by conducting a tortuous air flow and conserve space as implied by Burke et al. (col. 5, lines 50-60).

6. With regards to claim 3, Tanaka further discloses the first heat exchanger with at least one heat exchange element (Fig. 11).

7. With regards to claim 4, Tanaka further discloses the first heat exchanger with a flow path (Fig. 6, #3) and flowing medium (col. 4, lines 25-29).

8. With regards to claim 6, Tanaka further discloses the first heat exchanger having at least two heat exchange elements (Fig. 6, #2a and 2b) and a covering proceeding circumferentially around said rotational axis and disposed between said at least two heat exchange elements (Fig. 6 and 7, #3).

9. With regards to claim 10, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose a second annularly disposed heat exchanger.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have a second annularly disposed heat exchanger with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since duplication of essential working parts of a device only involves routine skill in the art. Furthermore, Kroener teaches a second heat exchanger (Fig. 1, #27). Burke et al. teaches an annular heat exchanger

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(Fig. 1, C). These heat exchangers are considered art-recognized equivalents in that they both are used in cooling down x-ray systems. It would have been within routine skill in the art to substitute the annularly disposed heat exchanger of Burke et al. for the second heat exchanger of Kroener. One would be motivated to use an annular heat exchanger to transfer heat generated by x-rays to another cooling apparatus as implied from Burke et al. (Fig. 1, C to D) and Kroener (Fig. 1, #27 to 35).

10. With regards to claim 11, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose wherein a second heat exchanger is disposed axially offset, along said rotational axis from said first heat exchanger.

Kroener further teaches wherein said second heat exchanger is disposed axially offset, along said rotational axis from said first heat exchanger and is attached to first heat exchanger (Fig. 1, #9 and 27).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the second heat exchanger disposed axially offset and attached to the first heat exchanger of Kroener with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since rearrangement of parts of an invention involves only routine skill in the art. One would be motivated to have a second heat exchanger attached to the first heat exchanger to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

11. With regards to claim 12, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose wherein a second heat exchanger comprises at least one heat exchange element.

Kroener further teaches at least one heat exchange element in the second heat exchanger (Fig. 1, #27).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have at least one heat exchange element of Kroener with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would be motivated to have at least one heat exchange element attached to the first heat exchanger to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

12. With regards to claim 13, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose wherein a second heat exchanger comprises at least two heat exchange elements connected.

Kroener further teaches at least two heat exchange elements in the second heat exchanger (Fig. 1, #27).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have at least two heat exchange element of Kroener with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would be

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motivated to have the heat exchange elements attached to the first heat exchanger to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

13. With regards to claim 14, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose further comprising a covering proceeding circumferentially around said rotational axis and disposed between said at least two heat exchange elements of said second heat exchanger.

Kroener teaches further comprising a covering proceeding circumferentially around said rotational axis and disposed between said at least two heat exchange elements of said second heat exchanger (Fig. 1, #29).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the coverings of Kroener with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would be motivated to use the coverings for moving mediums transferring heat from heat exchange elements attached to the first heat exchanger to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

14. With regards to claim 15, Tanaka in view of Kroener, Burke et al., and Deucher et al. suggests a system as recited above.

However, Tanaka does not disclose further a heat transfer medium flowing through the second heat exchanger in a flow path.

Kroener teaches a heat transfer medium flowing through the second heat exchanger in a flow path (Fig. 1, #24, 25, 28, and 29).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the heat transfer medium of Kroener with the suggested device of Tanaka in view of Kroener, Burke et al., and Deucher et al., since one would be motivated to use moving mediums transferring heat from heat exchange elements attached to the first heat exchanger to intensify the cooling effect as shown by Kroener (col. 2, lines 26-35).

Response to Arguments

15. Applicant's arguments filed 7/11/03 have been fully considered but they are not persuasive.

With regards to claims 8, 17, and 20, and the incorporated limitations of claims 16, 19, and 21, the focus of the arguments are on Deucher et al. and Burke et al. Deucher et al. discloses annular guide devices (Fig. 4, and col. 5, lines 10-23, "vanes"). The Examiner interprets inter-engaging annular guide devices from Burke et al. (Fig. 4, #70, and col. 5, lines 44-46, "annular vane"), not inter-engaging annular heat exchangers as interpreted by the Applicant. One would be motivated to incorporate these inter-engaging elements to remove excess heat as implied from Burke et al. (col. 5, lines 50-60).

Secondly, in response to applicant's argument that the structures would not be obvious due to the obvious lack of space in the structure disclose in the Burke et al. reference, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into

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the structure of the primary reference. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (703) 605-5298. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk

August 8, 2003



EDWARD J. GLACK
Supervisor/Examiner EXAMINER
TECHNOLOGY CENTER 2800